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TITLE:

LED LIGHT APPARATUS AND METHODOLOGY

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BACKGROUND OF THE INVENTION

This application is a continuation in part application claiming priority to U.S. Patent Application Serial No. 10/374,949 filed February 25, 2003.

1. Field of The Invention

Applicant's invention relates to an LED light apparatus and methodology. More particularly the present invention relates to an LED light apparatus and methodology that can produce a collinear beam of white or colored light.

2. Background Information

An LED is a light emitting diode. A diode is a semiconductor i.e. a material with a varying ability to conduct electrical current. A semiconductor with extra electrons is referred to as N-type material and in this material free electrons move from a negatively charged area to a positively charged area. In contrast, a semiconductor with extra holes is a P-type material. Electrons in the P-type material jump from hole to hole moving from a negatively charged area to a positively charged area. A diode is composed of a section of N-type material bounded to a section of P-type material, with electrodes on one end. This arrangement conducts electricity in only one direction. When no voltage is applied to the diode, electrons from the N-type material fill holes from the P-type material along the junction between the layers, forming a depletion zone. In a depletion zone, the semiconductor material is returned to its original insulating state (all of the holes are filled, so there are no free electrons or empty spaces for electrons, and charge

can't flow).

To get rid of the depletion zone, the electrons must get moving from the N-type area to the P-type area. In order to accomplish this, the N-type side of the diode is connected to the negative end of a circuit and the P-type side is connected to the positive end. The free electrons in the N-type material are repelled by the negative electrode and drawn to the positive electrode. The holes in the P-type material move the other way toward the negative electrode. When the voltage difference between the electrodes is high enough, the electrons in the depletion zone are boosted out of their holes and begin moving freely again. The depletion zone disappears and charge moves across the diode. The interaction between the electrons and holes generates light.

Light is a form of energy that can be released by an atom in packets known as photons. Photons are released as a result of electrons moving within the atom in orbitals around the nucleus. Electrons in different orbitals have different amounts of energy. For an electron to jump from a lower orbital to a higher orbital energy is often absorbed. However, an electron releases energy when it drops from a higher orbital to a lower orbital. The greater energy drop releases a higher energy photon which is typically characterized by higher frequency. Thus when free electrons move across a diode and fall into empty holes from the P-type layer they drop to a lower orbital and release energy in the form of photons.

Visible light emitting diodes, which are the type used in the present invention, are made up of materials that have a wider gap between their conduction band, or

higher orbital, and the lower orbitals. Thus when the electrons fall to the lower orbitals over such a large distance, the energy released can be seen. The size of the gap determines the frequency of the photon and hence the color of the light. LEDs are specially constructed to release a large number of photons outward. Additionally they are housed in a plastic bulb that concentrates the light in a particular direction. Most of the light from the diode bounces off the sides of the bulb and travels out the end.

LEDs have several advantages over conventional incandescent lamps. For instance, LEDs don't have a filament that will burn out so they have a longer life. In addition, LEDs are efficient. In conventional incandescent bulbs, the light production process involves generating a lot of heat since the filament must be warmed. This is completely wasted energy, because the majority of the available electricity is not used to produce light. LEDs generate very little heat with a much greater percentage of the energy being used to generate light.

Although the preferred embodiment of the present invention utilizes LEDs, other lights that exist that would be considered an obvious substitute in the industry can be used.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a novel LED light apparatus and methodology.

Still another object of the present invention is to provide a novel LED light apparatus and methodology that can produce a collinear beam of white or colored light.

An additional object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a base and a housing.

It is yet another object of the present invention to provide a novel LED light apparatus and methodology that incorporates upper, lower and side heat sinks to dissipate heat from the apparatus.

Another object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a red, blue and green LED light assembly with LED lights arranged in an a x a, a x b or other suitable geometric pattern and located within the interior of the apparatus housing.

Yet another object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a dichroic bandpass filter and dichroic notch filter arranged at a 45 degree angle to each other.

Still another object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a power driver for providing power to the apparatus.

An additional object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a microcontroller for controlling the apparatus.

Another object of the present invention is to provide a novel LED light apparatus and methodology that is an integrated web server being easily operated by any computer utilizing a standard industry browser.

Still an additional object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a mounting means and a housing.

Another object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a red, blue and green LED light assembly with LED lights arranged in a honeycomb pattern and located within the interior of the apparatus housing.

It is an additional object of the present invention to provide a novel LED light apparatus and methodology that incorporates a red, blue and green LED light assembly with a primary layer of LED lights arranged in an a x a or a x b pattern with a secondary layer of LED lights overlapping and offset from the primary layer but arranged in an a x a or a x b pattern as well.

Yet another object of the present invention is to provide a novel LED light apparatus and methodology that incorporates a dichroic bandpass filter and a dichroic notch filter intersecting to form an x-pattern and being generally at 90 degree angles to each other.

In satisfaction of these and related objectives, Applicant's present invention provides an LED light apparatus and methodology that can produce a collinear beam of white or colored light. The apparatus has a housing which incorporates three sets of LED light assemblies each set having a plurality of LED lights arranged in an a x a, a x b or other suitable geometric pattern. Each set contains LED lights of the same color, being either red, blue or green. A dichroic bandpass filter and a dichroic notch filter are

also incorporated. The apparatus is attached to a power driver which connects to a microcontroller, being a DMX controller, TC/IP controller, or the like. In one embodiment, the dichroic bandpass filter and the dichroic notch filter are arranged at 45 degree angles such that when the apparatus is turned on, red light from the red LED lights passes through the dichroic bandpass filter. The resulting light then combines with the blue light from the blue LED lights and passes through dichroic notch filter. This next light stream then combines with the green light from the green LED lights to form a collinear beam of white or colored light.

In another embodiment the dichroic bandpass filter and the dichroic notch filter intersect forming an x-pattern or four right angles. In this embodiment, red light from the red LED lights passes through both the dichroic notch filter and the dichroic bandpass filter. The resulting light from the dichroic bandpass filter combines with blue light from the blue LED lights and passes through the dichroic notch filter. This combined light stream then combines with green light from the green LED lights to form a collinear beam of white or colored light. In addition, the resulting light from the red light passing through the dichroic notch filter combines with green light from the green LED lights and passes through the dichroic bandpass filter. This combined light stream then combines with the blue light from the blue LED lights to form a collinear beam of white or colored light.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the preferred embodiment of the present

invention.

Fig. 2 is an exploded view of the preferred embodiment of the present invention.

Fig. 3 is a schematic of the internal operation of the preferred embodiment of the present invention.

Fig. 4 is a cut away side view of the preferred embodiment of the present invention.

Fig. 5 is a detailed cut away view of the preferred embodiment of the present invention.

Fig. 6 is a back perspective view of the second embodiment of the present invention.

Fig. 7 is a front perspective view of the second embodiment of the present invention.

Fig. 8 is an exploded view of the third embodiment of the present invention.

Fig. 9 is a schematic of the internal operation of the third embodiment of the present invention.

Fig. 10a is a top view of the LED light assembly of the preferred embodiment overlapped by an additional 15-array for use in any of the embodiments of the present invention.

Fig. 10b is a top view of the 15-array light assembly that can be incorporated into any embodiment of the present invention.

Fig. 11 is a top view of the first honeycomb light assembly that can be incorporated into any embodiment of the present invention.

Fig. 12 is a top view of the second honeycomb light assembly that can be incorporated into any embodiment of the present invention.

Fig. 13 is a top view of the third honeycomb light assembly that can be incorporated into any embodiment of the present invention.

Fig. 14 is a front perspective view of the fourth embodiment of the present invention.

Fig. 15 is a back perspective view of the fourth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 is a perspective view of the preferred embodiment of the present LED light apparatus 100. The apparatus 100 has a base 101 and a housing 102. Base 101can be assembled in many obvious designs to functionally support housing 102. In instances where it is necessary to secure the present apparatus 100 to the wall or ceiling, an appropriate mounting structure (not shown) can be attached to the top or back of the present invention effectively eliminating the need for the base 101. In the preferred embodiment, base 101 has two horizontal legs 103, each connected at the side of one end to opposing ends of connecting leg 104. At the end of horizontal legs

103 that incorporate connecting leg 104, there is attached at the top of each of horizontal legs 103 an angled leg 105 that extends upward to connect to housing 102 at base connection opening 108. Housing 102 as shown has two side heat sinks 106. Side heat sinks 106 are joined at their top portions with upper heat sink 107. The lower most portion of side heat sinks 106 being joined with lower heat sink 109. Attached at the front of apparatus 100 is light emission frame 110 bounded on its upper portion by upper heat sink 107 and on its lower portion by lower heat sink 109. Light emission frame 110 covers light emission screen 111.

In Fig. 2 an exploded view of the preferred embodiment of the present apparatus 100 is shown. Apparatus 100 has base 101 and housing 102. Base 101has two horizontal legs 103, each connected at the side of one end to opposing ends of connecting leg 104. At the end of horizontal legs 103 that incorporate connecting leg 104, there is attached at the top of each of horizontal legs 103 an angled leg 105 that extends upward. A connection nib 112 at the opposite end of angled leg 105 is used for connecting angled leg 105 to housing 102 at base connection opening 108.

Housing 102 as shown has two side heat sinks 106. Side heat sinks 106 are preferably passive heat sinks designed with side heat sink fins 124 and opening 125 to dissipate heat through convention. Side heat sinks 106 are designed to be joined at their top portions with upper heat sink 107. Upper heat sink 107 is a passive heat sink having upper heat sink fins 123 and designed to dissipate heat generated primarily at the upper portion of apparatus 100. The lower most portion of side heat sinks 106

are designed to be joined with lower heat sink 109. Lower heat sink 109 is a passive heat sink designed to dissipate heat primarily generated at the lower portion of the apparatus 100 with lower heat sink fins 126. Lower heat sink 109 is contiguous at one end with a connecting facia 129 which is designed to underlap with the lower portion of light emission screen 111. Contiguous at the remaining end of lower heat sink 109 is first vertical facia 130 which is designed to be secured to apparatus 100 by way of posts 114 which can be positioned through post openings 122. Attached at the front of apparatus 100 is light emission frame 110 bounded on its upper portion by upper heat sink 107 and on its lower portion by lower heat sink 109. Light emission frame 110 covers light emission screen 111. Light emission screen 111 can consist of a single screen or multiple screens. Etches, ridges, or the like can be included on these screens so as to manipulate the shape of the resulting beam of light from apparatus 100.

Contained centrally within apparatus 100 are three sets of LED light assemblies, 132, 133, and 134. Each set 132, 133, and 134 has a plurality of LED lights 117, 119, and 121, respectively, arranged in an a x a or a x b pattern. Other suitable geometries may be used as well. These may include, but are not limited to, circles, elipses, trapezoids, parallelograms, triangles, honeycombs, and the like. Each set contains LED lights of the same color, being either red 117, blue 119 or green 121. Red LED light assembly 132 contains red LED lights 117on its interior surface and heat sink 118 on its exterior surface. Blue LED light assembly 133 has blue LED lights

119 on its interior surface and heat sink 113 on its exterior surface. Fins 127 of heat sink 113 help dissipate heat. Green LED light assembly 134 contains green LED lights 121 on its interior surface and heat sink 120 on its exterior surface. Heat sink 120 is contiguous at one end with second vertical facia 131 used to connect heat sink 120 within apparatus 100. A dichroic bandpass filter 116 and a dichroic notch filter 115 are also incorporated within apparatus 100.

Fig. 3 is a schematic of the internal operation of the preferred embodiment of the present invention. Red LED light assembly 132 contains red LED lights 117 on its interior surface and heat sink 118 on its exterior surface. Heat sink 118 is preferably passive, but can be active as well. Where heat sink 118 is a passive heat sink it has no mechanical components and dissipates heat through convention. Active heat sinks on the other hand utilize power and are usually cooling fans, thermoelectric heat pumps (also known as Peltier junctions), or other similar cooling device.

Blue LED light assembly 133 has blue LED lights 119 on its interior surface and heat sink 113 on its exterior surface. Green LED light assembly 134 contains green LED lights 121 on its interior surface and heat sink 120 on its exterior surface. Heat sinks 113 and 120 can be active or passive heat sinks as well.

A dichroic bandpass filter 116 and a dichroic notch filter 115 are also incorporated within apparatus 100. The apparatus is attached to a power driver 135 which connects to a microcontroller 136, being a DMX controller, TCP/IP controller, MIDI controller, UDIP controller or the like. When the apparatus 100 is

turned on an additive color mixing process occurs. Red light from the red LED lights 117 passes through the dichroic bandpass filter 116. The resulting light then combines with the blue light emanating from the blue LED lights 119 and passes through dichroic notch filter 115. This combined light stream then combines with the green light from the green LED lights 121 to form a collinear beam of white or colored light. Apparatus 100 is also an integrated web server being easily operated by any computer utilizing a standard industry browser, such as Internet Explorer.

In Fig. 4 a cut away side view of the preferred embodiment of housing 102 of the present apparatus 100 is shown. As shown there is one side heat sink 106. As mentioned, side heat sink is preferably a passive heat sink designed with an opening 125 to allow dissipation of heat through convention. Base connection opening 108 is present to allow connection to base 101 (See Fig. 1). Side heat sink 106 is joined at its top portion with upper heat sink 107.

Upper heat sink 107 is preferably a passive heat sink as well having upper heat sink fins 123. Upper heat sink 107 is connected to upper heat sink support 139 Upper heat sink support 139 extends to the rear of housing 102 and connects to red LED light support 140. Red LED light support 140 has red LED light heat sink 118 connected at its exterior and red LED light assembly 132 attached at the interior. Red LED light assembly 132 has red LED lights 117. Toward the front of housing 102, upper heat sink support 139 extends and connects with one end of green LED light heat sink 120. Extending approximately medially below upper heat sink 107 is one

end of second vertical facia 131. The opposing end of second vertical facia 131 is contiguous with green LED light heat sink 120 which has fins 128 for the dissipation of heat from the green LED light assembly 134. Fins 128 are connected to the exterior side of green LED light assembly support 138. The interior side of green LED light assembly support 138 is connected to green LED light assembly 134 which contains green LED lights 121.

The lowermost portion of side heat sink 106 is joined with lower heat sink 109. Lower heat sink 109 dissipates heat primarily generated at the lower portion of apparatus 100 with lower heat sink fins 126. Lower heat sink 109 has lower heat sink support 141 which is contiguous at one end with connecting facia 129. Connecting facia 129 underlaps light emission screen 111. Contiguous at the remaining end of lower heat sink support 141 is first vertical facia 130 which is secured to housing 102 by way of posts 114. Attached at the front of apparatus 100 is light emission frame 110 bounded on its upper portion by upper heat sink 107 and on its lower portion by lower heat sink 109. Light emission frame 110 covers light emission screen 111.

Connected at the topmost portion of first vertical facia 130 is one end of blue LED light heat sink 127 designed to dissipate heat from the blue LED light assembly 133 and having fins 127. Blue LED light heat sink 127 is supported by blue LED light support 142. On the interior of blue LED light support 142 is blue LED light assembly 133 which has blue LED lights 119.

At the opposing end of blue LED light heat sink 127 is one end of red LED light

heat sink 118 which has fins 137 designed to dissipate heat through convention from red LED light assembly 132. Blue LED light support 142 connects with red LED light support140. Located centrally within housing 102 is dichroic bandpass filter 116 and dichroic notch filter 115.

Fig. 5 is a detailed cut away view of the preferred embodiment of the housing 102 of the present apparatus 100. As shown there is one side heat sink 106 joined at its top portion with upper heat sink 107.

Upper heat sink 107 is connected to upper heat sink support 139. Upper heat sink support 139 extends to the rear of housing 102 and connects to red LED light support 140. Red LED light support 140 has red LED light heat sink 118 connected at its exterior and red LED light assembly 132 attached at its interior. Red LED light assembly 132 has red LED lights 117. Toward the front of housing 102, upper heat sink support 139 extends and connects with one end of green LED light heat sink 120. Green LED light heat sink 120 has fins 128 for the dissipation of heat from the green LED light assembly 134. Fins 128 are connected to the exterior side of green LED light assembly support 138. The interior side of green LED light assembly support 138 is connected to green LED light assembly 134 which contains green LED lights 121. The front of green LED lights 121is placed at an angle 45° from dichroic notch filter 115. The angle of the green LED light ray 143 with respect to the green LED lights 121 is 90°, green LED light ray 143 striking dichroic notch filter 115 at a 45°angle. A line drawn normal to the center of the last red LED light 117a of red LED light assembly

132 is placed a distance n from the front of green LED lights 121.

The lowermost portion of side heat sink 106 is joined with lower heat sink 109. Lower heat sink 109 dissipates heat primarily generated at the lower portion of apparatus 100 with lower heat sink fins 126. Lower heat sink 109 has lower heat sink support 141 which is contiguous at one end with connecting facia 129. Connecting facia 129 underlaps light emission screen 111. Contiguous at the remaining end of lower heat sink support 141 is first vertical facia 130. Connected at the topmost portion of first vertical facia 130 is one end of blue LED light heat sink 113 designed to dissipate heat from the blue LED light assembly 133 and having fins 127. Blue LED light heat sink 127 is supported by blue LED light support 142. On the interior of blue LED light support 142 is blue LED light assembly 133 which has blue LED lights 119. The front of blue LED lights 119 is placed at an angle 45° from dichroic bandpass filter 116. The angle of blue LED light ray 144 with respect to the blue LED lights 119 is 90°, blue LED light ray 144 striking dichroic bandpass filter 116 at a 45°angle with respect to a line normal to the surface of dichroic bandpass filter 116. A line drawn normal to the center of the first blue LED light 119a of blue LED light assembly 133 is placed a distance n from the front of red LED lights 117.

At the opposing end of blue LED light heat sink 127 is one end of red LED light heat sink 118 which has fins 137 designed to dissipate heat through convention from red LED light assembly 132. A line drawn normal to the center of the first red LED light 117b of red LED light assembly 132 is placed a distance n from the front of blue

LED lights 119. The front of red LED lights 117 is placed at an angle 45° from dichroic bandpass filter 116. The angle of the red LED light ray 145 with respect to the red LED lights 117 is 90°, red LED light ray 145 striking dichroic bandpass filter 116 at an angle of 45° with respect to a line normal to the surface of dichroic bandpass filter 116. Blue LED light support 142 connects with red LED light support140. Located centrally within housing 102 is dichroic bandpass filter 116 and dichroic notch filter 115 being of the same length, one end of dichroic bandpass filter 116 being connected at a right angle with one end of dichroic notch filter 115.

When the apparatus 100 is turned on, red LED light rays 145 from the red LED lights 117 strike the backside of dichroic bandpass filter 116 at a 45° angle with respect to a line drawn normal to the surface of dichroic bandpass filter 116. Red LED light rays 145 pass through the dichroic bandpass filter 116. The resulting stream of red light then combines with the blue LED light rays 144 emanating from the blue LED lights 119. The blue LED light rays 144 strike the dichroic bandpass filter 116 at an angle 45° with respect to a normal drawn to the surface of the dichroic bandpass filter 116. In this case, the reflected blue light will be reflected at a 90° angle with respect to the incident blue LED light ray 144.

When the resulting stream of red light combines with the blue reflected light, the combined light passes through dichroic notch filter 115. The stream of light that passes through dichroic notch filter 115 then combines with green LED light rays 143 emanating from green LED lights 121. The green LED light rays 143 strike the

dichroic notch filter 115 at an angle 45° with respect to a normal drawn to the surface of the dichroic notch filter 115. In this case, the reflected green light will be reflected at a 90° angle with respect to the incident green LED light ray 143. When the resulting light from dichroic notch filter 115 combines with the green light from green LED lights 121, a collinear beam of white or colored light is formed.

In Fig. 6 a back perspective view of the second embodiment of the present apparatus 100 is shown. The apparatus 100 of the second embodiment is essentially the same as the preferred embodiment except base 101 has been modified to yoke 146. Apparatus 100 has a yoke 146 and a housing 102. Yoke 146 is designed to robotically control movement of apparatus 100. Yoke 146 at its lower portion has electronic assembly 147 which incorporates heat sink 148, having fins 149, connected to a connection fitting 150 that includes a port 151 for connection to an external power supply (See Fig. 3). Lower portion of yoke 146 houses the necessary electronics for operation of yoke 146 in controlling the movement of apparatus 100. Any standard robot control assembly can be incorporated herein. At the upper portion of yoke 146 is base 152 which is contiguous with two vertical legs 153 which extend upward from each side of base 152 and connect at their opposing ends to housing 102 at base connection opening 108.

Housing 102 has two side heat sinks 106. Side heat sinks 106 are joined at their top portions with upper heat sink 107 having fins 123. Located at the rear of housing 102 and connected to upper heat sink 107 is red LED light heat sink 118

having fins 137. Connected below red LED light heat sink 118 is blue LED light heat sink 113 with fins 127. Shown partially through opening 125 of side heat sink 106 is green LED light heat sink 120.

Fig. 7 is a front perspective view of the second embodiment of the present apparatus 100. The apparatus 100 has a yoke 146 and a housing 102. Yoke 146 is designed to robotically control movement of apparatus 100. Yoke 146 at its lower portion has electronic assembly 147 which incorporates heat sink 148. Lower portion of yoke 146 houses the necessary electronics for operation of yoke 146 in controlling the movement of apparatus 100. At the upper portion of yoke 146 is base 152 which is contiguous with two vertical legs 153 which extend upward from each side of base 152 and connect at their opposing ends to housing 102 at base connection opening 108.

Housing 102 has two side heat sinks 106. Side heat sinks 106 are joined at their top portions with upper heat sink 107 having fins 123. The lower most portion of side heat sinks 106 being joined with lower heat sink 109 having fins 126. Attached at the front of apparatus 100 is light emission frame 110 bounded on its upper portion by upper heat sink 107 and on its lower portion by lower heat sink 109. Light emission frame 110 covers light emission screen 111.

Fig. 8 is an exploded view of the third embodiment 200 of the present invention. The third embodiment 200 has a base 201 and a housing 202. Base 201 has two semi-triangular support members 203 connected by way of a central connecting

member 204. The semi-triangular support members 203 have openings 205 at their lowermost portion 203a for connection to central connecting member 204. The central connecting member 204 has mating openings 204a for connection to the openings 205 of the semi-triangular support members 203. At the uppermost portion 203b of the semi-triangular support members 203 is a housing connection opening 203c. A connection nib 209 is provided and is used to connect housing 202 to base 201 through base connection opening 208 and housing connection opening 203c.

Housing 202 as shown has two side heat sinks 206. Side heat sinks 206 are preferably passive heat sinks designed with side heat sink fins 224 and opening 225 to dissipate heat through convention. Side heat sinks 206 are designed to connect to encasing heat sinks (not shown) which contain the components of the third embodiment 200. Attached at the front of third embodiment 200 is light emission frame 210 which covers light emission screen 211. Light emission screen 211 can consist of a single screen or multiple screens. Etches, ridges, or the like can be included on these screens so as to manipulate the shape of the resulting beam of light from the third embodiment 200.

Contained centrally within third embodiment 200 are three sets of light assemblies 232, 233, and 234. Each set 232, 233, and 234 has a plurality of LED lights (See Fig. 2), respectively, arranged in an a x a pattern, a x b pattern or overlapping pattern of a x a on a x b, a x a on a x a, a x b on a x a or a x b on a x b (See Fig. 10a). Other suitable geometries can be used as well. These geometries may

include, but are not limited to, circles, elipses, trapezoids, parallelograms, triangles, regular polygon, irregular polygon, honeycombs (See Figs. 11, 12, and 13) and the like.

Each set contains LED lights of the same color, being either red, blue or green. Red LED light assembly 232 contains red LED lights (not shown) on its interior surface and heat sink 218 on its exterior surface. Fins 237 of heat sink 218 help dissipate heat. Blue LED light assembly 233 has blue LED lights (not shown) on its interior surface and heat sink 213 on its exterior surface. Fins 227 of heat sink 213 help dissipate heat. Green LED light assembly 234 contains green LED lights (not shown) on its interior surface and heat sink 220 on its exterior surface. Heat sink 220 has fins 228 and is contiguous at one end with second vertical facia 231 used to connect heat sink 220 within the third embodiment 200. A dichroic bandpass filter (See Fig. 2) and a dichroic notch filter (See Fig. 2) are also incorporated with the third embodiment 200 and situated along lines 251 and 250 respectively.

In Fig. 9 a schematic of the internal operation of the third embodiment of the present invention is shown. The red LED light assembly 232 is situated at a 90 degree angle to both the blue LED light assembly 233 and green LED light assembly 234. The blue LED light assembly 233 and the green LED light assembly 234 are positioned across from each other. Two rectangular filters 215 and 216 having notches in one side are mated at the notches to form an x-pattern. These rectangular filters 215 and 216 include a magenta dichroic bandpass filter 216 and a green dichroic notch filter

215. The magenta dichroic bandpass filter 216 and the green dichroic notch filter 215 in their x-pattern are situated within the open square formed by the red LED light assembly 232, blue LED light assembly 233, and green LED light assembly. As with previous embodiments, the third embodiment can be attached to a power driver which connects to a microcontroller, being a DMX controller, TCP/IP controller, MDI controller, UDIP controller, or the like.

When the third embodiment 200 of the present invention is turned on an additive color mixing process occurs. Red light from the red LED light assembly 232 pass through both the green dichroic notch filter 215 and the magenta dichroic bandpass filter 216. The resulting light through the magenta dichroic bandpass filter 216 combines with blue light emanating from the blue LED light assembly 233 and passes through the green dichroic notch filter 215. This combined light stream then combines with green light from the green LED light assembly 234 to form a collinear beam of white or colored light. In addition, the resulting light from the red light passing through the green dichroic notch filter 215 combines with green light from the green LED light assembly 234 and passes through the magenta dichroic bandpass filter 216. This combined light stream then combines with blue light from the blue LED light assembly 233 to form a collinear beam of white or colored light. The third embodiment 200 is also an integrated web server being easily operated by any computer utilizing a standard industry browser, such as Internet Explorer.

Fig. 10a is a top view of the LED light assembly of the preferred embodiment

overlapped by an additional 15-array for use in any of the embodiments of the present invention. Each of the present embodiments utilizes three sets of LED light assemblies 260. Each LED light assembly 260 has a plurality of LED lights (See Fig. 2), respectively, arranged in an a x a pattern or a x b pattern. Each set contains LED lights of the same color, being either red, blue or green. It is also possible to provide an overlapping array of LED lights. This overlapping array can include overlapping pattern of a x a on a x b, a x a on a x a, a x b on a x a or a x b on a x b. The preferred embodiment illustrates LED light assemblies containing a 3 x 4 array 261. This 3 x 4 array 261can be modified by including an offset 3 x 5 array 262 superimposed onto the 3 x 4 array 261. In Fig. 10b a top view of the 15-array light assembly that can be incorporated into any embodiment of the present invention is shown. Not only does the 3 x 5 array 262 work well superimposed onto the 3 x 4 array 261 as in Fig. 10a, but the 3 x 5 array 262 also works well alone on the LED light assembly 260.

Fig. 11 is a top view of the first honeycomb LED light assembly 270 that can be incorporated into any embodiment of the present invention. The first honeycomb LED light assembly 270 is generally shaped as a hexagon. This hexagon shape can be either regular as when all six sides and six angles are equal or irregular when the sides and/or angles are not equal. This first honeycomb LED light assembly 270 incorporates a plurality of LED lights 271 being of the same color either red, blue or green.

In Fig. 12 a top view of the second honeycomb LED light assembly 280 that can be incorporated into any embodiment of the present invention is shown. The second

honeycomb LED light assembly 280 is shaped as a modified hexagon. This hexagon shape can be either regular as when all six sides and six angles are equal or irregular when the sides and/or angles are not equal. This second honeycomb LED light assembly 280 as shown is irregular having a top 282 and bottom 283 of four units long with the four sides 284 of three units long. To the top 282 and bottom 283 are added a line of three units 285 and to the four sides 284 are added a line of two units 286. This second honeycomb LED light assembly 280 incorporates a plurality of LED lights 281 being of the same color either red, blue or green.

Fig. 13 is a top view of the third honeycomb LED light assembly 290 that can be incorporated into any embodiment of the present invention. The third honeycomb LED light assembly 290 is shaped as a modified hexagon. This hexagon shape can be either regular as when all six sides and six angles are equal or irregular when the sides and/or angles are not equal. This third honeycomb LED light assembly 290 as shown is irregular having a top 292 and bottom 293 of three units long with the four sides 294 of four units long. To the four sides 294 are added a line of three units 295. This third honeycomb LED light assembly 290 incorporates a plurality of LED lights 291 being of the same color either red, blue or green.

In Fig. 14 a front perspective view of the fourth embodiment 300 of the present invention is shown. The fourth embodiment 300 incorporates a housing 301 and a support bracket 302. Support bracket 302 can be assembled in various different designs to functionally support housing 301. This support bracket 302 makes it

possible to secure the fourth embodiment 300 to the wall or ceiling for use. This support bracket 302 can also be used with any of the other embodiments as well to accomplish the same purpose. The support bracket 302 has two arms 310 joined at one end by a central holding member 311. The remaining end of the two arms 310 are joined to housing 301 by way of attachment means 307.

Housing 301 is generally an elongated rectangular enclosure having side heat sinks 308, a top 309 and a front 303. Side heat sinks 308 are joined at their top portions with top 309. Side heat sinks 308 are preferably passive heat sinks designed with side heat sink fins 312 to dissipate heat through convection. Attached at the front 303 of the fourth embodiment 300 is a light emission frame 306. Light emission frame 306 covers light emission screen 313. Light emission screen 313 can consist of a single screen or multiple screens. Etches, ridges, or the like can be included on these screens so as to manipulate the shape of the resulting beam of light from the fourth embodiment 300. Contained centrally within the fourth embodiment 300 are the three sets of LED light assemblies arranged according to the scheme of Fig. 3 or the scheme of Fig. 9. In either scheme, one of the LED light assemblies 304 can be seen through light emission screen 313 as well as one of the filters 305.

Fig. 15 is a back perspective view of the fourth embodiment 300 of the present invention. Support bracket 302 is shown having two arms 310 joined at one end by a central holding member 311. The remaining end of the two arms 310 are joined to housing 301 by way of attachment means 307.

Housing 301 has side heat sinks 308, a bottom heat sink 315 and a back heat sink 314. Side heat sinks 308 are joined at their bottom portions with bottom heat sink 315 and at their back portions with back heat sink 314. Bottom heat sink 315 is preferably a passive heat sink designed with bottom heat sink fins 316 to dissipate heat through convection. Back heat sink 314 is also preferably a passive heat sink designed with back heat sink fins 317 to dissipate heat through convection. Attached at the front of side heat sinks 308 is light emission frame 306.

In each of the presented embodiments each of the LED lights can be positioned in different locations inside the present invention with the corresponding filter located adjacent thereto.

Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limited sense. Various modifications of the disclosed embodiments, as well as alternative embodiments of the inventions will become apparent to persons skilled in the art upon the reference to the description of the invention. It is, therefore, contemplated that the appended claims will cover such modifications that fall within the scope of the invention.